image

AF

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	
John FREEL et al.	Group Art Unit: 1764
Application No.: 09/490,147	Examiner: Walter Dean Griffin
Filed: January 24, 2000	Confirmation No.: 6801
For: LOW EMISSION, NON-OXYGENATED FUEL COMPOSITION	

BRIEF FOR APPELLANTS

Mail Stop APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated October 28, 2003, finally rejecting claims 1-3, 8-17, 22-28, 30-32, 37-42, 44-48, 52-59, 63-70 and 74-76, which are reproduced as an Appendix to this brief.

A check covering the ☐ $165.00 (2402) ☒ $330.00 (1402) Government fee and two extra copies of this brief are being filed herewith.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. A copy of this page and the signature page are submitted in triplicate.

Table of Contents

I. Real Party in Interest

The present application is assigned to Chevron U.S.A., Inc.

II. Related Appeals and Interferences

The undersigned legal representative, or assignee, does not know of any other appeal or interference which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1-3, 8-17, 22-28, 30-32, 37-42, 44-48, 52-59, 63-70 and 74-76 are presently pending and on appeal. No additional amendments have been made after the final rejection of October 28, 2003. The claims under appeal are set forth in the appendix to this brief.

IV. Status of Amendments

No amendment was filed subsequent to the final rejection.

V. Summary of the Invention

The presently claimed invention provides one with an unleaded gasoline fuel which is not in compliance with the California Predictive Model for reformulated gasoline, yet still offers good (low) emissions -- which result is not predicted by the California Predictive Model. (Page 4 of the specification, lines 16-21). The gasoline is also substantially free of oxygenates (as recited in claim 1). (Page 4 of the specification, lines 7-10). For it has been surprisingly found that low emissions,

particularly NO_x, can be observed for the gasoline fuels of the present invention, with the NO_x emissions being substantially lower than that predicted by the California Predictive Model established by the California Air Resources Board (CARB). (Page 4 of the specification, lines 22-25). Good performance with surprisingly low NO_x emissions can be obtained despite the fact that the gasoline fuel of the present invention does not meet the specifications of the CARB reformulated gasoline fuel and fails the California Predictive Model. This is achieved particularly due to the control of sulfur to extremely low levels. (Page 4 of the specification, lines 25-28; and page 12, line 26). The gasoline composition of the present invention is substantially free of oxygenates, does not meet the flat limits for at least one, if not more, of the aromatic, T90 and/or T50 requirements set for the reformulated gasoline, and fails the California Predictive Model for emissions. Nevertheless, the gasoline fuel of the present invention can still allow one to enjoy good emissions, and particularly surprisingly low NO_x emissions, while also avoiding the potential problems of oxygenates. (Page 5 of the specification, lines 1-6; and page 12, line 26). A big reason for this is that the gasoline also contains less than 10 ppmw sulfur.

Among other factors, therefore, the present invention is based upon the discovery that one can substantially remove all oxygen containing compounds from a fuel formulation, be within the cap limits prescribed by CARB, but fail to meet the flat limits for at least one, if not more, of the aromatics, T50 and T90 requirements for new reformulated gasoline, fail the California Predictive Model, and still obtain an excellent gasoline which exhibits low emissions. By observing the Reid vapor pressure and low sulfur, and preferably low olefin content requirements of the present invention, a gasoline fuel can be obtained which offers a substantially oxygenate free formulation allowing more flexibility to the refiner, but without sacrificing low emissions. The gasoline formulations of the present invention are particularly advantageous with regard to nitrogen oxide emissions (NO_x), for which there is increased concern with regard to the environment. (Page 13 of the specification, lines 4-16).

Thus, one of the main advantages of the invention is that a less polluting substantially oxygenate free gasoline fuel is provided that can be more easily prepared in a petroleum refinery or the like. That is, in a typical refinery in which gasoline is produced for sale, particularly in California, it is necessary or at least desirable in most instances to blend the hydrocarbon stocks so as to produce gasolines of specified Reid vapor pressure, aromatic content, etc., and which meet all of the CARB gasoline requirements. In addition, the gasoline must meet other specifications, such as octane to assure good performance of the automobile. The only difference is that now the refinery will blend the stocks in light of the information provided herein such that the emissions are reduced, particularly the NO_x emissions, as much as required or practicable, given the individual situation (the blend stocks available, refinery capacity, etc.) facing the particular refinery. By following the present invention, additional flexibility is offered in blending the fuels, particularly with regard to the aromatic hydrocarbon content, the T50 and T90 specifications. Yet, an environmentally friendly fuel is provided which offers good performance and surprisingly low NO_x emissions, as well as flexibility in blending. (Page 20 of the specification, lines 1-17).

VI. The Issues

1. Whether claims 1-3, 8-17, 22-28, 30-32, 37-42, 44-48, 52-59, 63-70 and 74-76 are unpatentable under 35 U.S.C. § 103(a) over Jessup et al. (U.S. Patent No. 5,288,393) taken in view of Kaneko et al. (U.S. Patent No. 5,401,280).

2. Whether it is appropriate for any of claims 1-3, 8-17, 22-28, 30-32, 37-42, 44-48, 50-59, 63-70 and 74-76 to be rejected under the judicially created doctrine of obviousness type double patenting as in being unpatentable over

(a) claims 1-14, 17-32 and 35-45 of copending application no. 10/210,089;

(b) claims 1-14, 17-32 and 35-45 of copending application no. 10/210,090;

(c) claims 1-14, 18-32 and 36-44 of copending application no. 10/120,497;

(d) claims 1-14, 18-32 and 36-44 of copending application no. 10/120,498;

(e) claims 1-14, 17-33 and 36-49 of copending application no. 09/603,899;

(f) claims 1-19, 23-35 and 39-51 of copending application no. 09/603,585;

(g) claims 26-46 of copending application no. 10/367,998;

(h) claims 1-25 of U.S. Patent No. 6,132,479; and

(i) claims 1-107 of U.S. Patent No. 6,383,236.

VII. Grouping of Claims

All claims stand or fall together.

VIII. Argument

1. Prior Art Rejection.

The Jessup et al. reference cited by the Examiner in no manner discloses or suggests the ability of a substantially oxygenate free gasoline to exhibit low emission and still offer flexibility while not meeting the requirements of the California Predictive Model. In essence, the control of sulfur in the gasolines of the present invention to amounts less than 10 ppmw allow one to not meet the requirements of the California Predictive Model, yet still offer low emissions, particularly with regard to NO_x, in a substantially oxygen free gasoline. The Jessup et al reference in no manner discloses or suggests the control of sulfur in order to obtain such a gasoline. Moreover, as acknowledged by the Examiner, Jessup also does not disclose a gasoline with an aromatic content of between 25 and 30 volume percent.

The Examiner cites Kaneko et al. as a reference suggesting the importance of controlling sulfur. It is submitted by applicants, however, that the addition of Kaneko et al. in no manner cures the deficiencies of Jessup et al., or in it's own right suggests the claimed invention.

The Kaneko et al. reference relates to a lead free, high octane gasoline made up of a selective class of C_5 and C_6 hydrocarbons and an oxygenate, specifically methyl-T-butyl ether (MTBE). The presence of the oxygenate MTBE is required in an amount of at least three volume percent, and up to 15 volume percent, and more preferably at least four volume percent. The presence of the oxygenate is an important characteristic of the Kaneko disclosure. The presence of the oxygenate in the Kaneko et al. formulation is important to achieve its cold startability and reduction in emissions of NO_x. The present invention is substantially oxygenate free, and therefore clearly distinguishes Kaneko et al. One of ordinary skill in the art, therefore, contemplating a low emission gasoline which is substantially oxygenate free, would not even consider Kaneko et al. It is also required that when one considers a reference, all of the teachings of that reference must be considered. One cannot simply pick and choose. Upon considering all of the teachings of Kaneko et al., the skilled artisan would only be directed to an oxygenate containing gasoline, and not the gasoline of the presently claimed invention.

Indeed, Kaneko et al. supports the patentability of the subject claimed invention. In particular, it suggests that the presence of an oxygenate is an important consideration for reduction of emissions of NO_x. Nevertheless, the presently claimed invention permits one to achieve reductions in NO_x while being substantially oxygenate free, and not even meeting the requirements of the California Predictive Model. Accordingly, Kaneko et al. teaches away from the present invention, and underscores the non-obviousness of the claimed invention. Its consideration alone or in combination with Jessup et al, therefore, can in no manner suggest Appellants' claimed invention.

The Examiner however, contends that the Kaneko et al. reference provides motivation for one of ordinary skill in the art to reduce sulfur amounts to levels within the claimed range regardless of the presence or absence or oxygenates in the gasoline. This is because the reference discloses that above a certain amount, sulfur can damage the exhaust gas cleaner. However, it is submitted by Appellants that the Kaneko et al. reference does not motivate one to use low amounts of sulfur in the blending of non-oxygenated gasoline, as required by the claimed invention.

More specifically, as disclosed in column 3, lines 16-20, it is stated that if the amount of sulfur is larger than 50 ppm by weight, this amount might be responsible for malfunction of an exhaust gas cleaner. Thus, the reference motivates one of skill in the art to simply maintain the sulfur amount to less than 50. It does state that it would be preferably less than 20, but one looking at blending an economical gasoline would simply follow the teachings of Kaneko et al. and push the amount of sulfur as high as possible to avoid damaging the exhaust gas cleaner, which can be anywhere up to 50 ppm sulfur. Such motivation actually directs one away from Appellants' claimed invention, as discussed previously.

More importantly, in full, the Kaneko et al. reference does not pertain to a gasoline which is substantially free of oxygenates, and thus cannot provide the requisite motivation to lower the amount of sulfur to less than 10 ppmw such that a gasoline can be obtained which exhibits good emissions, despite failing the California Predictive Model, and being substantially free of oxygenates. As discussed on page 20 of the present specification, one of the main advantages of the invention is that a less polluting, substantially oxygenate free gasoline fuel is provided that can be more easily prepared in a petroleum refinery or the like. That is, in a typical refinery in which gasoline is produced for sale, particularly in California, it is necessary or at least desirable in most instances to blend the hydrocarbon stock so as to produce gasolines of specific Reid vapor pressure, aromatic content, etc., and which meet all of the CARB gasoline requirements. The present invention allows a refinery to blend the stocks in a more practical manner and allowing reduced emissions, particularly the NO_x emissions. By following the present invention, additional flexibility is offered in blending the fuels, particularly with regard to the aromatic hydrocarbon content, the T50 and T90 specifications. Yet, an environmentally friendly fuel is provided which offers good performance and surprisingly low NO_x emissions, as well as flexibility of blending. This is all possible in a gasoline substantially free of oxygenates should the amount of sulfur be kept at less than 10 ppmw. Without the recognition of this advantage, the skilled artisan would not be motivated to push the sulfur level so low in a non-oxygenated fuel, because it could be costly to do so. If one were simply trying to avoid hurting an

exhaust gas cleaner as in Kaneko et al., up to 50 PPM sulfur can still be used, which would not provide the advantages realized by the claimed invention.

Moreover, it is well established that one must look to the problem solved as viewed in light of the teachings of the prior art. The particular problem facing the inventor must be considered in determining obviousness. See, e.g., In re Rinehart, 531 f. 2d 1048, 189 USPQ 143 (CCPA 1976), and In re Wright, 6 USPQ 2d 1959 (CAFC 1988). Thus the question is whether what the inventor did would have been obvious to one of ordinary skill in the art attempting to solve the problem upon which the inventor was working. In the present case, the problem of blending low-emission, high octane gasoline without oxygenates is daunting. The prior art does not suggest controlling the sulfur to 10 ppmw or less in order to do so, yet, Appellants discovered that such control permits one to more easily solve the problem. Kaneko et al. does not address this problem, and in fact, one working on the problem would not even consider Kaneko et al since it deals with MTBE containing gasoline. Kaneko et al. cannot address the problem solved by Appellants.

Accordingly, it is submitted that Kaneko et al. does not provide the missing motivation in Jessup et al. to practice Appellants' claimed invention.

2. Double Patenting Rejection

The Examiner has also provisionally rejected the claims of record over several pending U.S. applications and issued patents under the judicially created doctrine of obviousness-type double patenting. The Applications are U.S. Serial No(s) 10/210,089; 10/210,090; 10/120,497; 10/120,498; 09/603,899; 10/367,998; 09/603,585; and U.S. Patent No(s) 6,132,479 and 6,383,236. It is submitted that a Terminal Disclaimer can overcome such obviousness-type double patenting rejections, and Appellants submit that once allowable subject matter is indicated to exist in the subject application, such Terminal Disclaimers will be provided in order to overcome the double patenting rejections should the rejection remain. Once allowable subject matter is deemed to exist, the allowed subject matter can then be

compared to the claims of the copending application and issued patents. Thus, it is requested that these provisional rejections be held in abeyance until allowable subject matter is indicated, at which time the filing of Terminal Disclaimers will be made should the Examiner still deem such filings appropriate and necessary.

It should be further noted that the rejection over 09/603,899 is now moot in light of the abandonment of said application.

IX. Conclusion

In light of the foregoing, Appellants respectfully request reversal of the Examiner's rejection of the claims of record under 35 U.S.C. § 103.

Respectfully submitted,

Burns, Doane, Swecker & Mathis, L.L.P.

Date March 29, 2004

By: _____
E. Joseph Gess
Registration No. 28,510

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

APPENDIX

The Appealed Claims

1. An unleaded gasoline fuel, which is substantially free of oxygenates and has a Reid vapor pressure less than 7.5 psi;

a sulfur content less than 10 ppmw;

an aromatics content of greater 25 volume percent but no greater than 30 volume percent; and

the fuel composition fails the California Predictive Model requirements for emissions.

2. The unleaded gasoline fuel of claim 1, wherein the olefin content is 8.0 volume percent or less.

3. The unleaded gasoline fuel of claim 2, wherein the fuel has a Reid vapor pressure no greater than 7.0.

8. The unleaded gasoline fuel of claim 2, wherein the olefin content of the fuel is 6 volume percent or less.

9. The unleaded gasoline fuel of claim 2, wherein the olefin content of the fuel is 5 volume percent or less.

10. The unleaded gasoline fuel of claim 2, wherein the olefin content of the fuel is 3 volume percent or less.

11. The unleaded gasoline fuel of claim 2, wherein the olefin content of the fuel is no greater than about 2 volume percent.

12. The unleaded gasoline fuel of claim 2, wherein the fuel has a 50% D-86 Distillation Point no greater than 210°F.

13. The unleaded gasoline fuel of claim 2, wherein the fuel has a 90% D-86 Distillation Temperature no greater than 300°F.

14. The unleaded gasoline fuel of claim 1, wherein the fuel has a 50% D-86 Distillation Temperature between 210 and 220°F, and/or a 90% D-86 Distillation Temperature between 300 and 330°F.

15. An unleaded gasoline fuel, which is substantially free of oxygenates and has a Reid vapor pressure less than 7.5 psi;

a sulfur content less than 10 ppmw; and

a 50% D-86 Distillation Temperature greater than 210 but no greater than 220°F,

and the fuel composition fails the California Predictive Model requirements for emissions.

16. The unleaded gasoline fuel of claim 15, wherein the olefin content is 8 volume percent or less.

17. The unleaded gasoline fuel of claim 16, wherein the fuel has a Reid vapor pressure no greater than 7.0.

22. The unleaded gasoline fuel of claim 16, wherein the olefin fuel content is 6 volume percent or less.

23. The unleaded gasoline fuel of claim 16, wherein the olefin fuel content is 5 volume percent or less.

24. The unleaded gasoline fuel of claim 16, wherein the olefin fuel content is 3 volume percent or less.

25. The unleaded gasoline fuel of claim 16, wherein the olefin fuel content is no greater than about 2 volume percent.

26. The unleaded gasoline fuel of claim 16, wherein the aromatic hydrocarbon content is no greater than 25 volume percent.

27. The unleaded gasoline fuel of claim 16, wherein the fuel has a 90% D-86 Distillation Temperature no greater than 300°F.

28. The unleaded gasoline fuel of claim 16, wherein the fuel has an aromatic hydrocarbon content between 25 and 30 volume percent, and/or a 90% D-86 Distillation Temperature between 300 and 330°F.

30. An unleaded gasoline fuel, which is substantially free of oxygenates and has a Reid vapor pressure less than 7.5 psi;

a sulfur content less than 10 ppmw; and

a 90% D-86 Distillation Temperature between 300 and 330°F,

and the fuel composition fails the California Predictive Model requirements for emissions.

31. The unleaded gasoline fuel of claim 30, wherein the olefin content is 8 volume percent or less.

32. The unleaded gasoline fuel of claim 31, wherein the fuel has a Reid vapor pressure no greater than 7.0.

37. The unleaded gasoline fuel of claim 31, wherein the olefin fuel content is 5 volume percent or less.

38. The unleaded gasoline fuel of claim 31, wherein the olefin fuel content is 3 volume percent or less.

39. The unleaded gasoline fuel of claim 31, wherein the olefin fuel content is no greater than about 2 volume percent.

40. The unleaded gasoline fuel of claim 31, wherein the aromatic hydrocarbon content is no greater than 25 volume percent.

41. The unleaded gasoline fuel of claim 31, wherein the fuel has a 50% D-86 Distillation Point no greater than 210°F.

42. The unleaded gasoline fuel of claim 31, wherein the fuel has an aromatic hydrocarbon content between 25 and 30 volume percent, and/or a 50% D-86 Distillation Temperature between 210 and 220°F.

44. A method for operating an automotive vehicle having a spark-ignited, internal combustion engine, comprising:

introducing into the engine the unleaded gasoline fuel of claim 1, and then

combusting the unleaded gasoline in the engine.

45. The method of claim 44, wherein the automotive vehicle also has a catalytic converter into which at least some of the engine exhaust emissions created by combusting the unleaded gasoline is introduced, with emissions then being discharged from the catalytic converter and subsequently to the atmosphere.

46. The method of claim 44, wherein the introduction into the engine of an unleaded gasoline is accomplished by fuel injection.

47. The method of claim 45, wherein the introduction into the engine of an unleaded gasoline is accomplished by fuel injection.

48. The method of claim 45, wherein the gasoline introduced into the engine has a Reid vapor pressure no greater than 7.0.

52. The method of claim 45, wherein the gasoline introduced into the engine contains 5 volume percent olefin or less.

53. The method of claim 52, wherein the gasoline fuel introduced into the engine has an olefin content of 3 volume percent or less.

54. The method of claim 52, wherein the gasoline has an olefin content of no greater than 2 volume percent.

55. A method for operating an automotive vehicle having a spark-ignited, internal combustion engine, comprising:

introducing into the engine the unleaded gasoline fuel of claim 15, and then

combusting the unleaded gasoline in the engine.

56. The method of claim 55, wherein the automotive vehicle also has a catalytic converter into which at least some of the engine exhaust emissions created by combusting the unleaded gasoline is introduced, with emissions then being discharged from the catalytic converter and subsequently to the atmosphere.

57. The method of claim 55, wherein the introduction into the engine of an unleaded gasoline is accomplished by fuel injection.

58. The method of claim 56, wherein the introduction into the engine of an unleaded gasoline is accomplished by fuel injection.

59. The method of claim 56, wherein the gasoline introduced into the engine has a Reid vapor pressure no greater than 7.0.

63. The method of claim 56, wherein the gasoline introduced into the engine contains 5 volume percent olefin or less.

64. The method of claim 56, wherein the gasoline fuel introduced into the engine has an olefin content of 3 volume percent or less.

65. The method of claim 56, wherein the gasoline has an olefin content of no greater than 2 volume percent.

66. A method for operating an automotive vehicle having a spark-ignited, internal combustion engine, comprising:

introducing into the engine the unleaded gasoline fuel of claim 30, and then

combusting the unleaded gasoline in the engine.

67. The method of claim 66, wherein the automotive vehicle also has a catalytic converter into which at least some of the engine exhaust emissions created by combusting the unleaded gasoline is introduced, with emissions then being discharged from the catalytic converter and subsequently to the atmosphere.

68. The method of claim 66, wherein the introduction into the engine of an unleaded gasoline is accomplished by fuel injection.

69. The method of claim 67, wherein the introduction into the engine of an unleaded gasoline is accomplished by fuel injection.

70. The method of claim 67, wherein the gasoline introduced into the engine has a Reid vapor pressure no greater than 7.0.

74. The method of claim 67, wherein the gasoline introduced into the engine contains 5 volume percent olefin or less.

75. The method of claim 67, wherein the gasoline fuel introduced into the engine has an olefin content of 3 volume percent or less.

76. The method of claim 67, wherein the gasoline has an olefin content of no greater than 2 volume percent.